WHAT IS CLAIMED IS:

1. A pressure sensor comprising a member adherent by stiction to a surface of a substrate, means for heating the member and means for monitoring a temperature of the member.

2. The pressure sensor of claim 1 wherein at least one of:

a surface of the member in contact with the substrate; and,

the surface of the substrate in contact with the member;

has a surface roughness in the range of nanometers to tens of nanometers.

3. The pressure sensor of claim 1 wherein the means for heating the member comprises an electrically conductive pathway passing through the member and a source of electrical current connected to pass electrical current along the conductive pathway.

4. The pressure sensor of claim 3 wherein the electrically conductive pathway has a temperature-dependent electrical resistance and the means for monitoring a temperature of the member comprises the electrically conductive pathway.

5. The pressure sensor of claim 3 comprising an electrically insulating layer on a surface of the member.

6. The pressure sensor of claim 5 wherein the member comprises polysilicon and the electrically insulating layer comprises a layer of silicon dioxide.

7. The pressure sensor of claim 6 comprising an electrically insulating layer on the surface of the substrate.

8. The pressure sensor of claim 1 wherein the member comprises a bridge extending between a pair of cantilever members, each of the cantilever members having one end attached to the substrate and another end connected to the bridge.

9. The pressure sensor of claim 8 wherein the cantilever members are attached to the substrate by a pad and an oxide layer between the pad and the substrate.

10. The pressure sensor of claim 1 wherein the member has a length in the range of 50 μm to 250 μm and a width in the range of 1 μm to 10 μm.

11. The pressure sensor of claim 1 wherein the member comprises a generally linear elongated bridge supported above the substrate at either end, the bridge having a central portion collapsed onto and adhering by stiction to a surface of the substrate.

12. The pressure sensor of claim 1 wherein the substrate comprises silicon and the member comprises polysilicon.

13. A composite pressure sensor comprising first and second pressure sensors according to claim 1 arranged with first and second resistors in a Wheatstone bridge configuration having first and second output points and first and second input points, the first pressure sensor connected between the first input point and the first output point, the second pressure sensor connected between the second input point and the second output point, the first resistor connected between the first input point and the second output point and the second resistor connected between the second input point and the first output point.

14. The composite pressure sensor of claim 13 wherein the first and second resistors comprise members substantially the same as the members of the first and second pressure sensors but which are sealed to the surface of the substrate by an oxide layer.

15. The composite pressure sensor of claim 14 comprising a metallic masking layer covering the members of the first and second resistors.

16. The pressure sensor of claim 1 wherein the member comprises a material selected from the group consisting of silicon, polysilicon, copper, aluminum and tungsten.

17. The pressure sensor of claim 1 wherein the surface of the substrate is patterned with a pattern of plateaus and valleys in its portion

under the member, the member is adherent by stiction to the plateaus, and the member is not in contact with the valleys.

18. The pressure sensor of claim 17 wherein the plateaus and valleys differ in elevation by a distance in the range of 3 nanometers to 20 nanometers.

19. The pressure sensor of claim 1 wherein the means for monitoring a temperature of the member comprises a temperature member in the substrate and under the member.

20. The pressure sensor of claim 19 wherein the temperature sensor comprises a p-n junction.

21. A pressure sensor comprising a semiconductor wafer having a surface, an electrically conductive member in physical contact with the surface, the electrically conductive member being electrically insulated from the surface of the semiconductor wafer, wherein at least one of:

a surface of the electrically conductive member in contact with the substrate; and,

a surface of the substrate in contact with the electrically conductive member;

has a surface roughness in the range of nanometers to tens of nanometers.

22. A method for fabricating a narrow-gap thermal pressure sensor, the method comprising:

a) providing a member adjacent a substrate surface; and,

b) allowing a surface of the member to contact the substrate surface and adhere to the substrate surface by stiction.

23. The method of claim 22 wherein at least one of the substrate surface and the surface of the member has a surface roughness in the range of nanometers to tens of nanometers.

24. The method of claim 22 wherein providing a member adjacent a substrate surface comprises depositing the member on an oxide layer on the substrate surface, and the method comprises removing the oxide layer between the member and the substrate surface.

25. The method of claim 24 wherein removing the oxide layer between the member and the substrate surface is performed using a wet etching process and wherein allowing the surface of the member to contact the substrate surface comprises allowing surface tension to draw the member toward the substrate surface after the wet etching process.

26. The method of claim 25 comprising forming an oxide layer on the surface of the member between the wet etching process and allowing the member to contact the substrate surface.

27. The method of claim 26 wherein the member comprises polysilicon.

28. The method of claim 22 comprising forming a pattern of plateaus and valleys in the substrate

surface before providing the member adjacent the substrate surface.

29. The method of claim 28 wherein forming the pattern of plateaus and valleys comprises forming an oxide layer on the substrate surface, substantially removing the oxide layer in regions corresponding to the valleys, forming another oxide layer on the substrate surface and removing the oxide from the substrate surface.

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